REMARKS

The Office Action raised a statutory 35 U.S.C. §101 rejection as to Claims 1, 2 and 9.

Claims 1 and 2 have been redrafted and are believed to resolve this rejection. The Office Action acknowledged that functional descriptive materials were recorded on a recording medium. The Office Action contended that applicant's specification on Page 89 could be broadly construed so that "computer-readable medium" read in essence on a transitory non-tangible signal. However, Page 85, Lines 1-15 clearly defined numerous different physical examples of acceptable computer-readable recording medium.

The statement at Lines 5-7 does not detract from the statutory scope of our present invention. The definition of "any form of recording medium" that has "the capacity to record dynamic scenarios and Index Tables" is clearly not referring to a transitory or non-physical signal. However, to remove any doubt, applicant has proposed a minor amendment to Line 7 to define "in a physical structure" which clearly is a generic statement for the actual examples from Lines 7-15.

Additionally, applicant would direct the Examiner's attention to Paragraph (H) at Line 22 of Page 92, which does refer to a broadcast signal but only in a sense that the signal can be delivered for recording on a recording medium.

If there is any remaining questions with regards to this 35 U.S.C. §101 issue, the undersigned attorney would appreciate a telephone call.

The present invention resides in a highly competitive field of numerous international companies where skilled scientists and engineers are competing to provide economical consumer affordable products such as playback apparatus for optical disks and other recording medium that can use relatively inexpensive processors with an economical use of storage medium to enable

the consumer to enjoy expanded features and interactive applications in affordable playback apparatus or system. For example, without limitation, high definition BD-ROMS can be purchased with a capacity to present not only entertainment media such as movie titles, but also the capacity for the author or editor of the work to add additional features such as complementary scenes, additional commentary, related video games, and even the ability to offer for sale complementary articles, clothing, and other items that can be related to one or more portions or scenes in the movie. Thus, value added features can enable post-production enhancements to a successful movie so that a BD-ROM set can be sold in the after market of the release of a successful movie.

The present invention is directed to improvements in enabling cost-efficient components to be utilized in commercial playback apparatus for executing the functional material provided by these additional features.

As noted in our specification, it is a desire to improve the playback control technology that is available to a user as soon as possible to coordinate and simultaneously execute an application and, for example, a playback of a digitized movie work with the appropriate providing of a computer-readable recording medium, and an appropriate consumer playback apparatus.

Our present invention avoids an excessive load for reading and storing in a work memory and includes improvements in making the playback apparatus execute application signaling.

The application signaling, defined in our claims, is a technique to control a status of an application, such as starting or terminating, by providing a life cycle for the application. Our application signaling is advantageous for the following reasons.

When software of the playback apparatus and a plurality of applications are operated on one apparatus, deadlock may occur because the applications may attempt to use the same resource. In addition, some applications once activated will remain resided on the memory without being terminated so that the memory capacity may be cluttered with such applications. In such a situation, the operation of the apparatus can become very unstable. Therefore, a concept of "a life cycle of an application" is introduced by application signaling. A life cycle is a defined period in which an application, read into a work memory, is executable by a virtual machine.

As set forth in our claims, the activation and the termination of an application is controlled by defining a unit that is a title as a life cycle. In other words, a technical feature of the present invention is an execution of "title-boundary application signaling."

The present invention is characterized by the following technical features of Claim 1.

> A recording medium on which are recorded an index table, at least one application and an operation mode object,
>
> wherein the index table shows correspondence between the operation mode object and each title,
>
> the operation mode object is either (i) a movie mode object for a movie mode or (ii) a virtual machine mode object for a virtual machine mode, the movie mode object includes a navigation command showing a ,control procedure, the virtual machine mode object includes an application management table, each application is described in Java programming language, and stored in an archive file so that the application is readable into a heap area of a virtual machine, and the application management table shows one or more application that has a life cycle bound to the title corresponding to the virtual machine mode object.

A virtual machine mode object includes an application management table. The index table shows correspondence between the operation mode object and each title. Thus, when a title is switched to another title, the operation mode object can be switched accordingly. The

application management table stored in the virtual machine mode object enables an unactivated application to be activated and an activated application to be terminated. Since the index table can show a correspondence between an operation mode object and a title, an application is, therefore, provided with each of the plurality of titles as a life cycle as shown in Figures 14A and 14B.

FIG. 14A

title #1 APPLICATION MANAGEMENT TABLE

LIFE CYCLE	application ID	RUN ATTRIBUTE
title #1	application #1	AutoRun
title #1	application #2	AutoRun

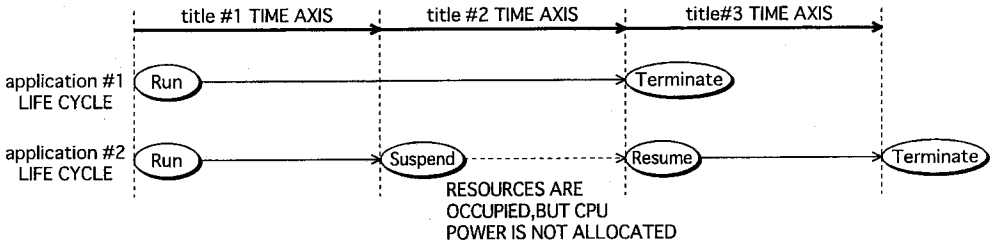
title #2 APPLICATION MANAGEMENT TABLE

LIFE CYCLE	application ID	RUN ATTRIBUTE
title #2	application #1	Persistent
title #2	application #2	Suspend

title #3 APPLICATION MANAGEMENT TABLE

LIFE CYCLE	application ID	RUN ATTRIBUTE
title #3	application #2	Persistent

FIG. 14B



According to the present invention, since a title can be managed as a life cycle of each application, consumption of a memory resource caused by the application can be managed at a playback unit that is the title. Even if a deadlock may occur during playback of a title due to the request between a plurality of applications for a resource, all the applications can be terminated by a user when selecting another title, which will compulsorily resolve such a deadlock. Furthermore, when applications creating an execution problem occupy memory during playback of a title, if a user selects another title, such an application corresponding to the title is

compulsorily terminated, which resolves the problem of a cluttered memory with such applications.

This realizes stable management of memory resources in which unnecessary consumption of a memory resource can be avoidable. See specification Page 50, Line 18 to page 52, Line 5.

By describing a correspondence between the operation mode object and the title in the index table, the title is defined as a life cycle of each application. Accordingly, consumption of the memory resource caused by the applications is regulated in each playback unit that is the title.

In addition, the application management table is included in the virtual machine mode object. This virtual machine mode object instructs, for each title, an operation mode in the second mode out of two operation modes that are the first mode (movie mode) and the second mode (virtual machine mode).

The first mode (movie mode) is an operation mode in which the playback apparatus is operated based on a command. As with a DVD playback apparatus, the first mode is an operation mode in which operation is performed based on a navigation command in the program chain. The second mode (virtual machine mode) is an operation mode in which a playback apparatus is operated based on program of the Java language and by a Java virtual machine. The operation mode object of the present invention is a mode for instructing the playback apparatus to be operated in the second mode.

Therefore, as with the DVD playback apparatus, when this operation mode object in the second mode is applied to a command-based apparatus that is operated based on a navigation command in the program chain, the operation mode object enables the command-base apparatus

to switch from the first mode to the second mode so that the application can be activated based on the management table included in the operation mode object.

Thus, when the operation mode object is applied to the command-base apparatus, the application signaling can also be executed in the command-base apparatus, because the mode switching is performed and the activation and the termination of the application are controlled for each title.

In view of the number of pages in the specification and sheets of drawings, applicant wishes to draw the attention of the Examiner to the following grounds as support for the amendments to the current claims.

1) The addition of the index table is based on the disclosure of the Index Table shown in Figure 29 and Page 48, Line 24 to Page 49, Line 25 of the fourth embodiment disclosed in the original specification. *This index table includes the Title#m+1 to #nINDEX of the Titles that are the m+1 to n-th entries on the BD-ROM. Written in these Indexes are respective identifiers (IDs) of BD-J objects that are branch destinations when a Title number is selected from among m+1 to n.* Thus, the index table is clearly described in the above-mentioned portion of the original Specification.

2) The addition of the movie mode object and the virtual machine mode object, respectively, correspond to the MOVIE Object and the BD-J Object disclosed in the detailed explanation of the Specification. Herein, the "MOVIE" of the MOVIE Object is an abbreviation of a "MOVIE mode" that is an operation mode in which a DVD compatible module is used. The "BD-J" of the BD-J Object is an abbreviation of a "BD-J mode" that is an operation mode in which a Java virtual machine is used. Accordingly, the movie mode object and virtual machine mode object are clearly described in the above-mentioned portion of the original Specification.

3) The addition of the application management table is based on the disclosure of the application management table shown in Figures 12-14 and Page 20, Line 9 to Page 21, Line 3 of the original Specification.

According to the above-mentioned portion of the original Specification, *The Title#m+1 to #nINDEX are Indexes of the Titles that are the m+1 to n-th entries on the BD-ROM. Written in these Indexes are respective identifiers (IDs) of BD-J objects that are branch destinations when a Title number is selected from among m+1 to n.*

The description of the detailed invention shows that the index table is used for selecting the title number.

4) The addition of the module manager is based on the disclosure in Figures 18-21 and on Page 35, Lines 15-25 of the original Specification.

The module manager 34 holds the IndexTable that is read from the BD-ROM, and performs branch control. The branch control includes receiving a Title number that is a jump destination when the HDMV module 33 has executed a JumpTitle command or when the BD -J module 35 has issued a Title jump API, and notifying the Movie Object or the BD-J Object that composes the Title to the HDMV module 33 or the BD-J module 35.

It can be construed that in the process of this branch control, one title corresponding to the title number that is the jump destination is selected as the "current title" from a plurality of titles described in the index table.

The change of the applications is based on the disclosure on Page 16, Line 18 to Page 17, Line 23 of the original Specification.

Claims 1-3, 7 and 9-10 were held to be anticipated under 35 U.S.C. §102(b) by *Tsumagari et al.* (U.S. Patent Publication 2003/0161615). The *Tsumagari et al.* reference was

broadly cited for an enhanced navigation system where playback control information was written in a JavaScript to enable branching between titles and at least one application.

The invention described in *Tsumagari et al.* is directed to a playback apparatus playing back ENAV contents 30. ENAV contents 30 can be obtained not only from a DVD-video but also from a WWW server.

Paragraphs 0065-0066 of *Tsumagari et al.* describes as follows.

> Logically, ENAV contents 30 can be classified into ENAV playback information and the data body of ENAV contents. The data body of ENAV contents contain audio data, still image data, text data, moving image data, and the like. The ENAV playback information contains a markup language, script language, or the like, which describes playback method (display method, playback order, playback switch sequence, selection of data to be played back and the like) of the ENAV contents data body and/or D VD-video contents 10. For example, as a language used as the playback control information, markup language such as HTML (Hyper Text Markup Language)/XHTML (eXtensible Hyper Text Markup Language), SMIL (Synchronized Multimedia Integration Language), and the like, script language such as ECMA (European Computer Manufacturers Association) Script, Java Script, and the like, and so forth can be used in combination. The description contents of the ENAV playback information described in these languages are parsed by ENAV interpreter 330 in Figure 1 to interpret the parsed contents.

ENAV contents 30 recorded in another recording area cannot be played back by a conventional DVD video player, but can be played back by the DVD video player (Figure 1). Since ENAV contents 30 can be described in a Java language, argumentatively the present invention and *Tsumagari et al.* have in common that some form of application management can be achieved. However, the following differences can be found between the present invention and *Tsumagari et al.*

First, the specifying manner of the contents to be activated is different between the present invention and *Tsumagari et al.*

Paragraphs 0079-0081 of *Tsumagari et al.* describes as follows.

> As practical methods of playing back ENAV contents 30 recorded on disc 1 in FIGURE 30 or 31, for example, a method of providing a select button of ENAV contents 30 to a DVD menu (VMG menu or VTS menu), and allowing the user to select the ENAV contents button by operating cursor keys and an enter key, and a method of automatically accessing ENAV contents 30 based on internal commands (navigation, commands such as a GoTo command, Jump command, and the like) of the DVD-Video player are available.

According to either one of the above methods, the activation of ENAV contents 30 is instructed by a command, and not by the application management table included in the virtual machine mode object corresponding to the title in the index table.

Since ENAV contents 30 of *Tsumagari et al.* are not managed by the application management table, an extended application is not activated nor terminated according to the switching of the titles. Thus, the extended application is not subject to application signaling of our invention.

Second, the activation timing is also different between the present invention and *Tsumagari et al.* According to Paragraphs 0155-0157 of *Tsumagari et al.*, the playback apparatus of *Tsumagari et al.* starts playback of the DVD-video title and playback of ENAV contents 30 as follows.

> On the ENAV engine 300 side, after ENAV interpreter 330 fetches ENAV contents 30 (step ST20), and is ready to exchange command/event/property with event generation-command/property processor 320, it waits for some event (step ST22, NO in step ST24; corresponding to "event wait" in the second column of Figure 5). If the "DVD event signal indicating menu call" is output in step ST16, and event generation-command/property processor 320 receives this DVD event signal (YES in step ST24; corresponding to "downward arrow" of the second column of Figure 5), ENAV interpreter 330 checks if fetched ENAV contents 30 include ENAV menu contents.

* * *

> On the other hand, if ENAV contents 30 include ENAV menu contents (YES in step ST26), event generation-command/property processor 320 executes an ENAV menu process in accordance with an ENAV command from ENAV interpreter 330 (step ST32).

That is to say, the execution of ENAV contents 30 is triggered by a menu call in the DVD-video title. As is clear from this, when a title corresponding to the virtual machine mode object is selected as a current title, according to *Tsumagari et al.*, such control is NOT performed when an application having a life cycle bound to the title corresponding to a virtual machine mode object is activated.

Third, the operation mode is different between the present invention and *Tsumagari et al.* According to *Tsumagari et al.*, Figure 7 shows an operation mode in which video contents are mainly displayed (full video mode in Figure 7), Figure 8 shows an operation mode in which ENAV contents are mainly displayed (full ENAV mode in Figure 8), and Figure 11 shows an operation mode in which video contents and ENAV contents are displayed (mixed frame mode (mixed mode)). However, in any operation modes according to *Tsumagari et al.*, the playback of ENAV contents 30 is started after the playback of the DVD-video title. This is because ENAV contents 30 are activated upon a menu call performed by a user during the playback of the title, and the execution of the title playback is prerequisite for the activation of ENAV contents 30.

Tsumagari et al. may suggest a first mode (movie mode) in which the playback apparatus is operated based on a command, but does not disclose a second mode (virtual machine mode) in which the playback apparatus is operated not based on the first mode but based on the application.

Since *Tsumagari et al.* is silent on any correspondence to a second mode, *Tsumagari et al.* does not disclose information defining a control procedure in the second mode. *Tsumagari et al.* cannot provide a teaching corresponding to a virtual machine mode object nor an index table.

As described above, since the specifying manner of an application, the activation timing of the application and the operation mode is different between the present claims and *Tsumagari et al.*, a playback apparatus of *Tsumagari et al.* cannot realize an application signaling using a Title as a life cycle of an application. Accordingly, the present invention is not obvious over *Tsumagari et al.*

The Office Action also rejected Claims 4-6 and 8 as being unpatentable over the *Tsumagari et al.* publication in view *Murase et al.* (U.S. Patent No. 5,907,658) assigned to the present applicant.

Murase et al. teaches a recording medium in the form of a DVD-Video, that has recorded thereon a video object (VOB) composed of a video stream, an audio stream, and a sub-picture stream multiplexed together. The video object is composed of a plurality of video object units, with each video object unit including video data (i.e., a GOP), sub-picture data, and a management information pack.

Murase et al. also discloses a PGC command table containing set commends and branch commands used for branching among different PGCs to enable optional scenes chosen by a user with a menu. The set commands and branch commands of *Murase et al.* arguably correspond to only the commands described in the paragraphs 0079-0081 of *Tsumagari et al.* More specifically, *Tsumagari et al.* discloses a command for switching from one title to another title at playback of the DVD-video title. *Murase et al.* does not disclose any application signaling by

using a title as a life cycle. Accordingly, Claims 4-6 and 8 are not obvious over any hypothetical combination of *Tsumagari et al.* and *Murase et al.*

As noted in ex parte *Rinkevich et al.*, Appeal 207-1317, May 29, 2007 at Page 9:

> We note that the U.S. Supreme Court recently reaffirmed that "[a] factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautions of argument reliant upon *ex post* reasoning." *KSR Int'l Co. v. Teleflex Inc.,* 127 S. Ct. 1727, 82 USPQ2d at 1397. *See also Graham v. John Deere Co.,* 383 U.S. at 36, 148 USPQ at 474. Nevertheless, in *KSR* the Supreme Court also qualified the issue of hindsight by stating that "[r]igid preventative rules that deny factfinders recourse to common sense, however, are neither necessary under our case law nor consistent with it." *KSR Int'l Co. v. Teleflex Inc.,* 127 S. Ct. 1727, 82 USPQ2d at 1397. In the instant case, we conclude that a person of ordinary skill in the art *having common sense* at the time of the invention would not have reasonably looked to Wu to solve a problem already solved by Savill. Therefore, we agree with Appellants that the Examiner has impermissibly used the instant claims as a guide or roadmap in formulating the rejection.

It is respectfully submitted that the present claims are now in condition for allowance and an early notification of the same is requested.

If the Examiner believes a telephone interview will assist in the prosecution of this case, the undersigned attorney can be contacted at the listed phone number.

Very truly yours,

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